SOIL SURVEY OF THE SMEDES AREA, MISSISSIPPI.

By WILLIAM G. SMITH and WILLIAM T. CARTER, Jr.

LOCATION AND BOUNDARIES OF THE AREA.

The Smedes area extends east and west 52 miles and is 18 miles wide north and south in the western half, while the remaining eastern part is only 6 miles wide. For convenience the area has been divided into the Smedes sheet and the Bentonia sheet. It adjoins on the south the area surveyed in 1901. The southern boundary is a straight east-and-west township line extending from the Choctaw meridian westward to the Mississippi River. The area lies in Ts. 9, 10, and a part of 11, north of the Choctaw base, and Rs. 1 to 9 W., inclusive. Parts of Yazoo, Madison, Issaquena, and Sharkey counties are comprised within the area. (See fig. 8.)

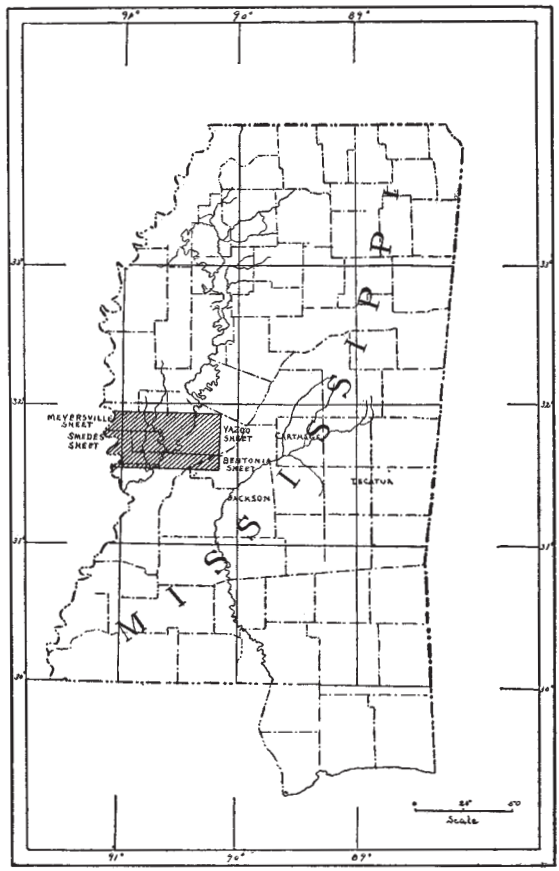


FIG. 8.—Sketch map showing areas surveyed in Mississippi.

There were no available road maps suited to the needs of the survey. The base used was made by plane-table traversing carried on in conjunction with the soil mapping. In making up the final base county maps were relied on to some extent.

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

The region in which the Smedes area lies was first visited by Ponce de Leon, Pamfilo de Narvaez, and De Soto in the first half of the sixteenth century. These Spanish explorers, influenced by the treasure taken in the conquest of Mexico, explored this country, not with a view to developing it agriculturally, but in search of gold and other precious minerals and gems. Their failure to make permanent settlements, indeed, gave ground for the establishment of French sovereignty in the latter half of the same century, following the explorations of Father Marquette and Sieur de la Salle. The French in turn did little to advance the region agriculturally, although they built some forts, the most important being Fort Rosalie on the present site of Natchez, and Fort St. Peter, not far from the mouth of the Yazoo River, and held the country for nearly one hundred years. They were chiefly concerned in Christianizing the Indians and in fur trading. In these undertakings they suffered much from the warlike character of the natives.

The territory came under English rule by treaty with France in 1763, and under the policy of the English the real beginning of agriculture took place. The liberal offers of land by the Crown attracted men of character and ability to the new possession, the Indians were soon subjugated, and the laws of England, insuring security to life and property, were put in force.

Under such conditions it is but natural that agriculture made marked progress. Important settlements were made on the Bayou Pierre, the Big Black River, and the Walnut Hills. The most of these were on the uplands, but later some large plantations were opened up on the higher alluvial lands fronting on the main streams. Tobacco and indigo, once the leading staple crops, were in time supplanted by cotton. The old records also enumerate rice, sugar, flaxseed, corn, buckwheat, barley, pease, oats, rye, wheat, and potatoes as crops grown.

The laborers during this period seem to have been chiefly German redemptioners and African slaves. Iron was scarce, and wooden implements formed an important part of the farm equipment. The one principal means of transportation was by flatboat down the river to New Orleans, whence the products were shipped by trading vessels to the mother country and Europe. By the same means dairy products and other needed supplies were brought into the region from Ohio and other Northern territory.

The country took no part in the Revolutionary war, but rather served as a refuge for both parties to that struggle. It continued to grow and prosper, disturbed only occasionally by marauding bands from the contending armies at the North. But this agricultural progress was to receive another check. Galvez, the Spanish governor of

Louisiana, in 1781 brought the territory by force again under Spanish dominion, following which change of sovereignty various circumstances tended to deaden industry.

The invention of the cotton gin, by Whitney, in 1794, however, gave a great impetus to cotton production in spite of the unfavorable political conditions. Yet the permanent well-being of the section was not assured until 1798, when it came under the authority of the Federal Constitution as a Territory.

Mississippi was admitted as a State in 1817. From that time to the present day cotton has remained the great staple crop of the area surveyed, and its prosperity has fluctuated with the price of this commodity. The almost exclusive cultivation of this crop has produced a system of agriculture far from perfect, a system calculated to impoverish the soil and to make the solvency of the tiller of the soil entirely too dependent upon the yield and price of this one crop. It has resulted in a system of liens against the growing crop, taken to raise the money to pay for necessaries of life that might be largely produced upon the farm.

This is unfortunate, but at the same time it brings distinctly to view the fact that the country has great possibilities before it in the introduction of a diversified agriculture, combined with rational treatment of its naturally fertile soils.

CLIMATE.

The climate of the region is that of the warm temperate zone of the United States. This would seem to admit of a wide diversification of crops, so that nearly all the chief agricultural necessities of the community should be produced within the area.

The temperature tables show a comparatively uniform range for both summer and winter. A fairly high temperature, with a high humidity, may, however, occur during July and August, when the heat becomes quite oppressive. The winters are quite open, the soil seldom freezing, and the housing of cattle being usually regarded as unnecessary. Occasionally the soil freezes an inch or two, and thin ice forms in the creeks, but such conditions rarely last more than a few days. Snow seldom falls, and when it does it remains on the ground but a short time. Still, occasionally much suffering has been caused by cold waves of unusual severity.

The first killing frost in the fall may be looked for about the first week in November, while danger from late spring frosts is past by the last week in March.

The annual precipitation for the delta area is thought to be somewhat higher than for the upland. The rains come mostly during the spring, fall, and winter months, while during the important cotton-picking season—September, October, and November—the precipitation is least.

There were no weather-observation records obtainable for the area itself, but those included in the following table, from Weather Bureau records, are believed to represent the climatic conditions of the area fairly well:

Normal monthly and annual temperature and precipitation.

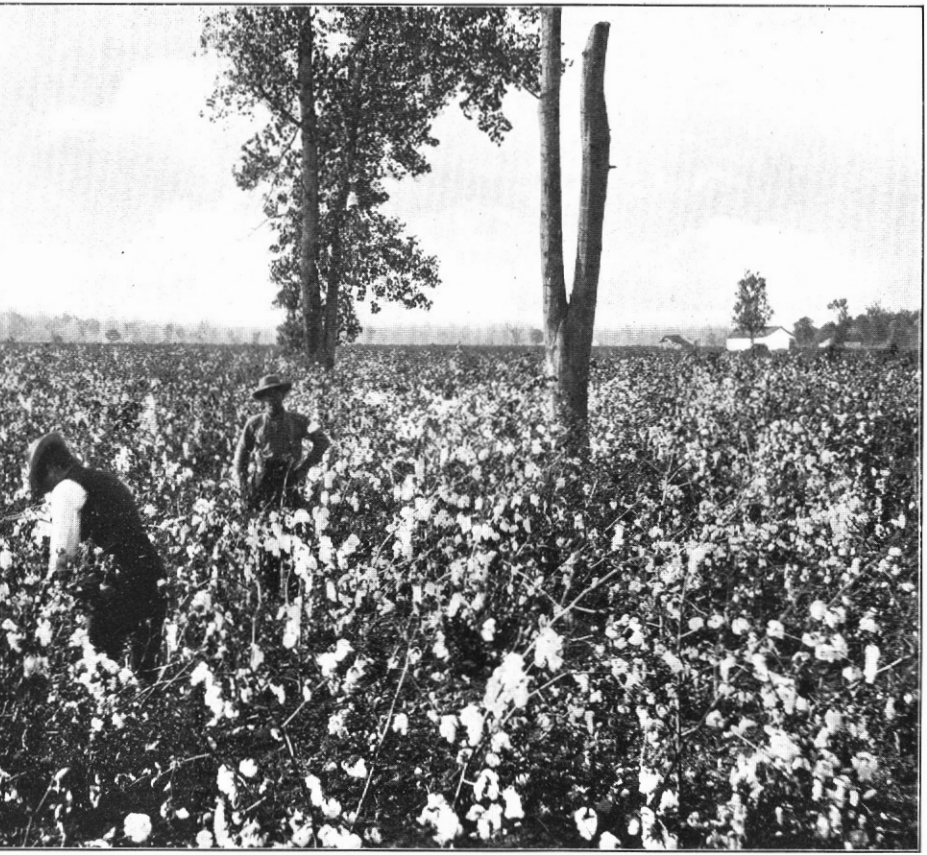
Month.	Agricultural College.		Greenville.		Vicksburg.		Yazoo City.		Crystalsprings.	
	Temperature.	Precipitation.	Temperature.	Precipitation.	Temperature.	Precipitation.	Temperature.	Precipitation.	Temperature.	Precipitation.
	°F.	In.	°F.	In.	°F.	In.	°F.	In.	°F.	In.
January	.....	.....	45.7	5.38	47.6	5.76	46.4	6.06	47.7	6.52
February	.....	.....	48.1	4.36	52.2	4.70	45.4	4.43	48.9	5.19
March	.....	.....	52.4	5.84	58.2	6.14	60.0	5.69	59.2	3.97
April	64.8	3.21	66.5	4.14	66.0	5.86	66.8	4.48	66.8	3.69
May	71.8	3.26	72.9	3.45	72.6	4.94	76.3	3.02	74.1	3.65
June	78.2	3.39	78.9	3.72	80.0	4.67	81.4	3.96	79.8	4.73
July	80.9	5.32	81.4	4.33	81.2	4.47	83.4	4.92	81.4	6.74
August	79.9	4.47	80.6	3.80	81.2	3.32	83.5	4.71	80.8	4.42
September	73.5	2.74	74.6	2.86	76.0	3.37	76.9	2.42	75.9	2.53
October	64.6	1.62	63.1	1.95	66.4	2.69	64.5	1.80	66.8	2.08
November	54.0	2.86	53.5	3.74	56.2	4.48	55.5	3.10	56.1	3.19
December	48.2	4.17	47.7	3.77	50.6	4.96	47.7	4.09	48.8	5.64
Annual	.....	.....	63.8	47.12	65.7	54.42	65.6	48.68	65.5	53.11

Dates of killing frosts.

Year.	Agricultural College.		Greenville.		Vicksburg.		Yazoo City.		Crystalsprings.	
	Last in spring.	First in fall.	Last in spring.	First in fall.	Last in spring.	First in fall.	Last in spring.	First in fall.	Last in spring.	First in fall.
1892	Mar. 20	Nov. 11	Mar. 19	Nov. 11	Mar. 2	Nov. 11	.....	.....	.....	Nov. 10
1893	Mar. 6	Oct. 29	Mar. 5	Oct. 16	Apr. 22	Nov. 15	.....	Oct. 30	Mar. 30	Oct. 15
1894	Mar. 29	Nov. 9	Mar. 30	Oct. 31	Mar. 29	Nov. 11	Mar. 30	Nov. 6	Mar. 30	Oct. 9
1895	Mar. 21	Nov. 2	Mar. 21	Oct. 10	Mar. 17	Nov. 11	Mar. 21	Nov. 2	Mar. 21	Oct. 21
1896	Apr. 3	Dec. 3	Mar. 20	Oct. 18	Mar. 20	Nov. 9	Mar. 21	Nov. 8	Apr. 3	Nov. 6
1897	Feb. 27	Nov. 17	Feb. 27	Nov. 17	Feb. 27	Nov. 17	Feb. 27	Nov. 10	Feb. 27	Nov. 17
1899	Mar. 29	Nov. 3	Mar. 29	Nov. 3	Mar. 7	Nov. 3	Mar. 29	Nov. 3	Mar. 29	Nov. 3
1900	Apr. 5	Nov. 9	Mar. 17	Nov. 9	.....	.....	Mar. 31	Nov. 10	Apr. 1	Nov. 4

PHYSIOGRAPHY AND GEOLOGY.

The Smedes area consists of two distinct physiographic divisions—the Mississippi River flood plain or "delta," lying about 100 feet above the level of the Gulf of Mexico, and the upland or "hill country," lying about 250 feet above the delta lands. The delta extends from the Mississippi River to the upland, a distance of about 30 miles, with a relatively flat surface, whose variation in level is probably not more than 20 feet. The higher elevations of the delta occur next to the rivers and streams, and were therefore the first to be settled and tilled, and, indeed, the present cultivated areas are limited largely to these frontage lands. The drainage system consists of numerous steep-sided, winding streams, crooked bayous, and narrow lakes. These



AL COTTON FIELD ON THE YAZOO LOAM, SMEDES AREA, MISSISSIPPI.

during the wet season are usually full to overflowing. At other seasons they are quite shallow, or in many cases entirely dry.

The upland is separated from the delta or "valley land," as it is called locally, by a sharp escarpment about 150 to 300 feet high. This escarpment extends from Memphis to Baton Rouge as a long, flat arc. About one-sixth of the area of the State lies in the Mississippi River flood plain, while the remaining five-sixths consists of upland.

The upland comprised within the limits of the present survey extends from the delta lands to beyond the Big Black River, a distance of about 20 miles. Originally the surface was plateaulike, but it is now in places very much dissected. The upland itself, by reason of the difference in erosion, falls naturally into two distinct areas, known as the "Cane Hills" and the "Flat Hills." The area of the Cane Hills extends back from the delta lands about 6 miles. All the rest of the area consists of the Flat Hills. A line is drawn on the soil map, indicating approximately the boundary between these two sections.

The Cane Hills area consists of narrow, steep-sided ridges and cross ridges, flanked by deep, V-shaped gullies and stream valleys. The roads usually follow the main ridges, and when it is understood that the streams are usually from 20 to 100 feet lower than the crest of the ridges, some idea of the surface conditions may be gained from an inspection of the soil map. Only about one-fifth of the Cane Hills area, consisting of the tops of the ridges and some of the narrow stream bottoms, can be cultivated. The rest of the Cane Hills supports a natural hard-wood forest, and an undergrowth of switch cane and shrubbery, well suited for stock range. The streams of the section have quite a rapid fall toward the delta, and are subject to torrential floods.

In the Flat Hills area erosion has not been so great, the depth of the stream valleys ranging from 5 to 50 feet. The drainage is toward the Big Black River, and the fall is more moderate. Perhaps two-fifths or more of the surface of the Flat Hills section is now cultivated, while considerable more admits of cultivation.

The geological differences between the delta and the upland are fully as marked as the surface differences. The upland consists of an upper stratum of fine yellow silt (loess) 20 to 40 feet deep, underlain by a stratum of sand and gravel (Orange sand) 1 to 3 feet thick. This is in turn underlain by massive blue or yellowish-blue clay (Eocene), the thickness of which was not learned. The upper stratum is the one of greatest economic importance. The upland soils are derived solely and the delta soils in part from this material. The loess is marked by a very uniform silty texture throughout. It contains shells of the genus Helix, which have in part been dissolved by the action of ground waters. The lime thus derived has been formed in some instances into curiously shaped concretions and nodules. This loess is of wide distribution in the Mississippi Valley, extending from Iowa almost to the Gulf of Mexico. The sand and gravel stratum underlying the loess

has very little effect on the soils, occurring at too great a depth to have much influence on the drainage. In deep road cuts it is exposed, and is thus available for surfacing the roads. Usually the sand and gravel is deeply stained, evidently by a brown or reddish-brown iron oxide. Frequently this stratum is found firmly cemented together.

The massive clay underlying the sand and gravel is very plastic and slippery when wet, and becomes very hard when dry. The line of demarcation between the clay and the superimposed stratum is quite distinct. The clay is very impervious to water, and where it outcrops along the bluff the ground is oozy, and there is much seepage water from the uplands. This clay stratum, however, generally passes beneath the delta.

Numerous marine shells, together with the vertebræ of sharks and whales, are found in the clay. Individual crystals of honey-colored gypsum are also found in outcrops, and here and there beds of lignite.

The geology of the delta area is even more simple than the upland. It consists of alluvial material laid down by the waters of the Mississippi and Yazoo rivers and their tributaries, in a valley previously excavated by the Mississippi River through the older geological formations. Geologically the delta is the youngest formation in the area, and it is still being formed by the addition of new material during inundations. Four important soil types are derived from this alluvium—a sandy loam, a loam, a friable clay, and a heavy, waxy clay. All are naturally fertile and each has undeveloped agricultural possibilities.

SOILS.

There are seven soil types in the Smedes area. Four of these types, the Yazoo sandy loam, Yazoo loam, Yazoo clay, and Sharkey clay, are derived from the alluvium of the Mississippi flood plain. The remaining three types, the Memphis silt loam, Lintonia loam, and Meadow, are found in the upland and are derived from the loess.

The following table gives the area of the different types, the total area surveyed, and the proportion which each type is of the whole:

Areas of different soils.

Soil.	Bentonia sheet.	Smedes sheet.	Total area.	Proportional extent.
	Acres.	*Acres.*	*Acres.*	*Per cent.*
Sharkey clay	7,488	141,952	149,440	50.5
Memphis silt loam	52,160	128	52,288	17.8
Yazoo clay	704	37,056	37,760	12.8
Yazoo loam	3,712	16,576	20,288	6.8
Meadow	17,408	.....	17,408	5.8
Lintonia loam	9,280	1,088	10,368	3.5
Yazoo sandy loam	384	8,128	8,512	2.8
Total	91,136	204,928	296,064	.....

YAZOO SANDY LOAM.

The Yazoo sandy loam consists of 6 to 8 inches of medium to fine sandy loam varying from yellow to dark brown in color, underlain by a subsoil of brown loam, usually heavier in texture than the soil. The heaviness of both soil and subsoil varies somewhat. Where the type occurs along the Mississippi River where there has been a break in the levee, or where from any cause there has been a rapid flow of water, the texture is coarser; while farther inland, as, for example, along Deer and other creeks, the soil is quite uniformly a fine sandy loam underlain by a heavy subsoil sometimes quite clayey in texture. This is the texture, also, of much of the type as it occurs next to the Mississippi River, where it has been normally laid down, or, in other words, where it has been only indirectly influenced by breaks in the levees.

The Yazoo sandy loam occurs in narrow bands or ridges along the rivers, streams, and drainage ways. The surface is usually from 1 to 6 or more feet higher than the land lying more remote from the streams. The type may occur as a uniform band or slightly rounded ridge along a given stream, as knolls, or as a series of parallel ridges separated by narrow areas of clay or heavy loam. The latter areas are found in the bends of streams where the flood waters cut across. Such ridges are also found where breaks in the levees have occurred. The usual position of this soil type seems to be on the front lands of the streams, where it extends in narrow bands slightly elevated above the other soils.

Owing to its texture and also to its location the Yazoo sandy loam is naturally well drained. Its elevation above the other soils allows the surface water to flow off in all directions, while its open texture provides for a ready downward movement of the soil water.

The Yazoo sandy loam, in common with the other types occurring in the Mississippi River flood plain, owes its origin to deposition. The coarser materials held by the water naturally are the first to be deposited when the movement of the water is in any way checked. Thus as the streams become swollen and begin to overflow their banks a large part of the coarser material is almost at once deposited next the stream channel, while the finer silt and clay is carried farther inland to be deposited in thin layers by the stiller waters. The successive inundations of this character soon build up higher ground along the stream banks, generally of a sandy or light loamy texture. This material consists of fine particles of quartz and mica, with some admixture of silt and clay. These represent minerals that have, through weathering and the leaching action of water, been reduced to a relative chemical simplicity. Much of this soil type, however, contains some decayed vegetable matter, derived in part from the growth and decay of plant life on it and in part from that carried in by floods. The type is as a

whole well supplied with plant food. The occasional flooding of the land doubtless accounts for the maintenance of its fertility. Most of the Yazoo sandy loam within the limits of the present survey has been under cultivation for over half a century, and some has been in use for more than three-quarters of a century. During all this time cotton has been grown almost exclusively. The yield of cotton ranges from one-half bale to three-fourths bale per acre, and in some cases yields of 1 bale or more are secured, especially when improved methods of tilling the land are practiced.

Corn is grown to some extent, but the rate of yield is low, being from 10 to 25 bushels per acre. Crab-grass hay and cowpeas are grown and fair yields are secured. Truck crops, such as sweet potatoes, Irish potatoes, cabbages, radishes, turnips, melons, etc., are successfully grown in a small way for home supply.

As has been said, cotton is the chief crop grown on the Yazoo sandy loam, and under the circumstances fair yields are obtained, but judging from its texture and location it would seem that this soil is better adapted to truck growing. This impression was strengthened by observation of the small patches of sweet potatoes and other truck crops grown around the plantation houses and negro cabins. These truck patches all gave evidence of good yields, even with the ordinary cultural methods in use. The location of this soil next the streams affords, in many instances, a ready means of marketing, while in some cases railroad transportation is available.

The Yazoo sandy loam is easily cultivated and has a market value quite as high as any of the alluvial soils, the price ranging from $20 to $60 per acre. The type is almost all cleared and under some form of cultivation. It is one of the best soils of the alluvial section.

The following table of mechanical analyses shows the texture of the soil and subsoil of this soil type:

Mechanical analyses of Yazoo sandy loam.

[Fine earth.]

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7992	¼ mile E. of Fitler P. O.	Loose sandy loam, 0 to 12 inches.	1.28	0.00	0.00	0.10	1.30	56.54	37.64	4.44
7994	1 mile N. of Smedes.	Brown sandy loam, 0 to 10 inches.	.92	.00	.20	.10	.44	16.80	72.74	9.70
7993	Subsoil of 7992.....	Sandy loam to clay, 12 to 36 inches.	1.17	.00	.10	.08	.74	28.30	61.72	9.12
7995	Subsoil of 7994.....	Sandy loam to loam, 10 to 36 inches.	.84	.00	.24	.24	1.50	3.60	60.56	33.76

YAZOO LOAM.

The Yazoo loam consists of a dark-brown or yellow silty loam from 6 to 8 inches deep, underlain by a heavy drab clay subsoil containing considerable silt. The surface soil is loose and powdery when dry, and only moderately sticky when very wet. When normally moist it is very mellow and easy to cultivate.

The Yazoo loam is found as narrow bands along streams, lakes, bayous, and drainage ways. Being intermediate in texture between the Yazoo sandy loam previously described and the clay soils of the back lands, its location is naturally between areas of these types.

The surface of the Yazoo loam often has a gentle slope from the stream toward the back lands. Occasionally quite extensive areas show a flat or gently rolling surface.

The drainage of the Yazoo loam is similar to that of the Yazoo sandy loam, although it is not so complete. By reason of its location this soil receives the drainage from the Yazoo sandy loam, and its surface being rather flat the movement of soil water toward the back lands is not so rapid. However, by the aid of open ditches this type may readily be well drained when the streams are not abnormally high.

The Yazoo loam owes its origin to the same processes as the other delta soils. The particles of which it is formed are smaller than those of the Yazoo sandy loam and were laid down farther from the stream channels and in stiller water. The yet finer particles of clay in suspension in the flood waters were largely carried farther inland and slowly deposited or left by evaporation, resulting in the formation of the two clay types described later. The occasional extensive, flat areas of Yazoo loam near the foothills of the bluff may have been formed by the spreading of silt from the bluff land out over the delta clays during earlier periods of exceptionally high water. At any rate there is a very close similarity in texture between the soil of the Yazoo loam and that of the brown silty loam (Memphis silt loam) found on the bluffs.

The Yazoo loam, being heavier in texture than the adjoining sandy loam, may be regarded as containing minerals less reduced toward chemical simplicity, and therefore as containing a greater proportion of stored plant food. The dark color usually characterizing the soil would indicate the presence of a fair amount of decayed vegetable matter. At any rate, field experience indicates this to be a fertile soil, and the occasional overflows do much to maintain this natural fertility.

The Yazoo loam, like the type previously described, was one of the soils early cleared and used in the growing of cotton. Good yields of cotton are secured nearly every year, the yield per acre varying from three-fourths bale to 1 bale. (See Pl. XVI.) It is capable of growing good crops of corn, yielding from 20 to 40 bushels per acre, while the introduction of the methods employed in typical corn areas would no

doubt greatly increase these yields. A change in present methods is certainly a matter worthy of serious consideration by the planters.

In adaptation this soil is very similar to the Yazoo sandy loam, and what was said relative to this subject in the description of that soil might be repeated with equal force here. A slow development of the truck interests might be brought about at this time.

The Yazoo loam is held at from $20 to $60 an acre. The average price is as high if not higher than any of the other soils in the area. Along the larger waterways the greater part of the type is cleared and under cultivation, but along the smaller streams and drainage ways located in the back lands, or "swamp" areas, much of the type still retains its original forest growth, consisting of oak, hackberry, gum, and other trees and shrubs. The undergrowth in these forests is almost always a thick stand of blue cane. This blue cane is seen in some of the abandoned fields. Unless great care is exercised crab grass takes possession of the cotton and corn fields. The coco grass also gives serious trouble and seems almost impossible to eradicate when once it gains a foothold.

This type, like the preceding, is used for building sites. The improvements consist usually of the plantation house of the owner or manager, valued at from $800 to $2,000; a barn and sheds, valued at from $100 to $1,000, and, somewhat removed from these, several negro cabins, valued at from $50 to $100 each.

On the whole, the Yazoo loam is one of the choice soils of the area. It was much sought after by the early settlers and is still in demand. Its texture and location are features that make it particularly desirable.

The following analyses show the texture of the soil and subsoil of this type:

Mechanical analyses of Yazoo loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7990	½ mile W. of Smedes.	Brown, slightly sandy loam, 0 to 10 inches.	1.23	0.00	0.18	0.14	0.74	16.42	65.58	17.00
7991	Subsoil of 7990.....	Brown loam, 10 to 36 inches.	.91	.00	.12	.20	1.50	13.68	60.04	24.32

YAZOO CLAY.

The Yazoo clay consists of a drab or bluish clay soil about 5 inches deep, underlain by a plastic mottled yellow or grayish clay. Sometimes a layer of sand is encountered at a depth of 3 or 4 feet. The

type is locally termed "buckshot" land. This term has reference to the peculiar manner in which the clay breaks up, upon drying, into small cubical aggregations about the size of buckshot. This term is also used for certain of the soils occurring in the bluff land, but here the soil is silty in texture and contains numerous dark-brown iron concretions about the size of buckshot. There is no marked similarity between the delta soil and the bluff soil.

To the farmers there are two classes of Yazoo clay, known as "blue buckshot" and "black buckshot" land. These terms characterize in a general way the amount of vegetable mold in the clay, and to the tiller of the soil it means the one is difficult to plow and cultivate, except within certain very narrow moisture limits, while the other admits of plowing and tilling under quite a wide range of moisture conditions. The blue buckshot if plowed when too wet sinks back into the furrow and the field dries off, leaving a surface hard and refractory, while if plowed when too dry large clods, very slow to disintegrate, are turned up. On the other hand, the black buckshot, except when very wet or very dry, mellows down into excellent tilth after plowing. After a few years of cultivation and the addition of vegetable matter the two phases become about the same.

The Yazoo clay, when undisturbed by tillage, upon drying is dissected by a system of cracks, often several inches in depth. The surface wash of fine dark clay and organic matter fills these cracks, and much fertility is thus incorporated with the soil. This process materially assists the work of cultivation by improving the tilth.

The Yazoo clay occupies the low-lying border of the frontage lands of the streams. It represents the third grade of alluvial soil in point of texture, as well as in location, beginning with the sandy and loamy soils found on the front lands.

The surface of the Yazoo clay is generally quite flat, and this in connection with the clayey texture results in imperfect drainage. It is necessary to assist the natural drainage by open ditches. For much of the type these still need to be extended. This open-ditch method seems to be best suited to the type. The conditions are such at present as would probably not warrant the expense of drainage with tile. Owing to the compact nature of the subsoil tile drains would have to be placed at quite frequent intervals to be effective. As the population increases and these lands become more in demand, and as a more intensive system of tillage is instituted, a combination of the open-ditch drain and tile drain systems will doubtless find a place on the Yazoo clay, just as it has in the areas of heavy clay soils in Ohio.

The Yazoo clay owes its origin to deposition in comparatively still water. It is formed of the clay and fine silt particles which were longer in suspension than the heavier particles of the front land soils.

This soil is naturally very fertile. The heavy texture and the

countless numbers of particles of clay and fine silt afford abundant opportunities for the absorption of soluble salts from flood waters. Judging from the crops secured under the exhaustive system of cropping practiced, it would seem as if the adsorption theory of soluble salts for use as plant food finds here a practical affirmation. Chemical analyses of soils in Louisiana similar to this type have revealed a lime content as high as 1 per cent. This comparatively large amount of lime in the soil, together with the high content of organic matter, probably accounts in a large measure for the peculiar manner in which this clay breaks up into small cubical aggregations. The water drawn from wells sunk in the Yazoo clay has a very disagreeable taste. When first drawn it is quite clear, but after standing a few hours it turns a yellowish-green color, due possibly to an alteration of the iron salts in solution. Rain water is relied on almost entirely for drinking purposes.

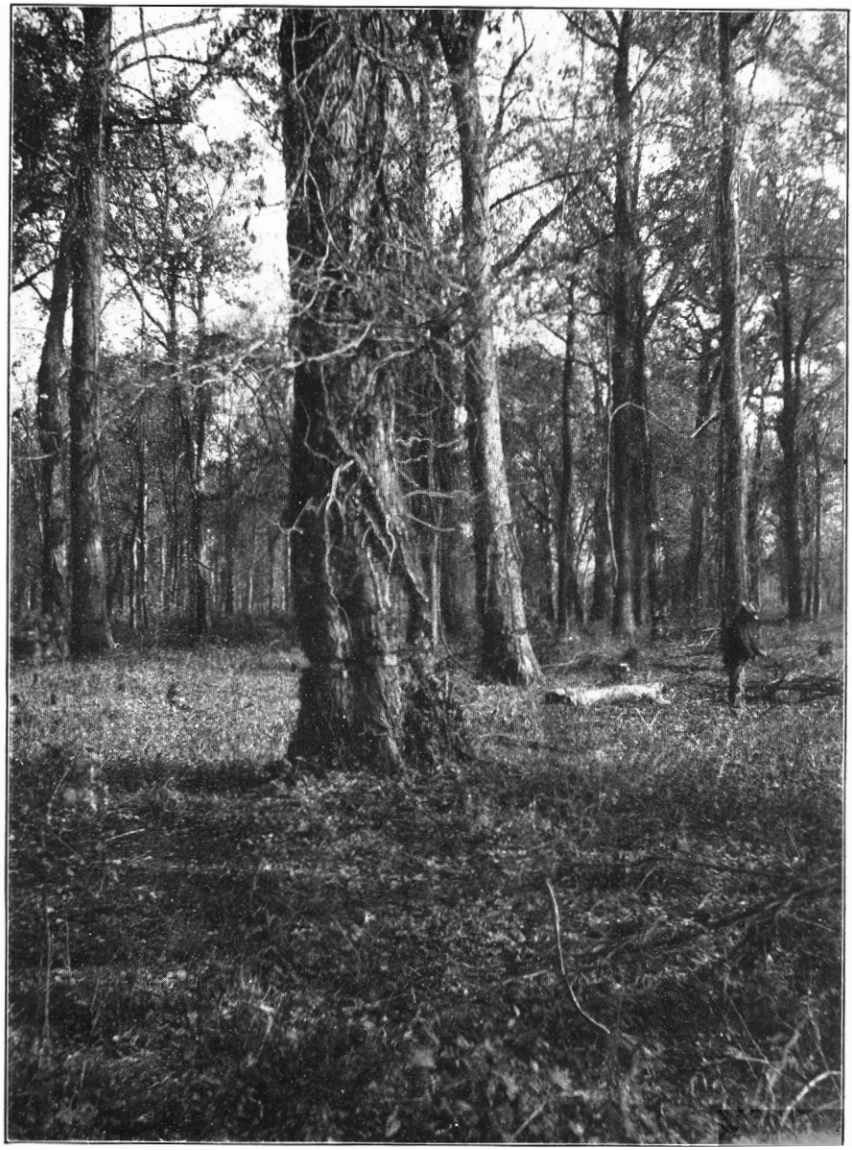
Cotton is the chief crop on the Yazoo clay. Occasionally some corn is grown. The yield per acre of cotton averages about 1 bale; of corn, from 20 to 40 bushels. Good yields of crab grass, Bermuda grass, and cowpeas are secured.

The Yazoo clay is a fertile, productive soil, well suited to the growing of cotton. It may be regarded as the typical cotton soil of the area. Where extra care has been practiced yields closely approximating 2 bales of cotton to the acre have been obtained. It also produces corn and grass well. It would seem as if turnips, onions, and other garden crops requiring a heavy soil might be grown successfully.

The Yazoo clay is held at prices ranging between $20 and $60 an acre. It is much in demand, is highly prized by those who own it, and little if any of it is on the market.

A great part of the Yazoo clay is cleared and under cultivation, and the cultivated area is gradually being extended by clearing up some of the more remote "back lands." Much of the type has been many years under cultivation, and yet it shows little sign of being run down, even with the exhaustive methods practiced by the planters up to the present time, for it is now one of the most productive soils of the delta region, with possibilities of further improvement that will make it a great deal more productive and valuable.

The table of mechanical analyses on page 337 shows the texture of the soil and subsoil of the Yazoo clay.



CHARACTERISTIC HARD-WOOD FOREST GROWTH OF THE SHARKEY CLAY, SMEDES AREA, MISSISSIPPI.

This soil is annually under water from the river floods until the first of June, after which it is too late to plant and mature crops. It is exceedingly fertile and could be reclaimed by dikes.

N THE CANE HILLS REGION OF THE MEMPHIS SILT LOAM, SMEDES AREA, MISSISSIPPI.
The soil is everywhere eroded and cut up in the most frightful manner.

Mechanical analyses of Yazoo clay.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7988	⅛ mile E. of Smedes.	Dark clay, 0 to 6 inches.	1.33	0.10	0.20	0.14	0.50	4.04	48.00	46.98
7989	Subsoil of 7988.....	Dark clay loam to clay, 6 to 36 inches.	.90	.00	.20	.24	1.64	7.52	61.02	29.60

SHARKEY CLAY.

The Sharkey clay consists of 3 to 5 inches of a rather dark yellow waxy clay, underlain by a waxy mottled yellow clay to a depth of several feet. In some cases a layer of sand is found at a depth of 4 or 5 feet. The type is locally known as "swamp" land. It is low, wet, and subject to frequent overflow, and is covered with standing water usually until the 1st of June. The local variations in texture are very slight.

Where the type occurs near the foothills of the bluff lands it is of a gray or light drab color and seems to contain considerable silt. This makes it even more boggy than in those areas of heavier clay more remote from the foothills. This peculiar phase is locally termed "buck dough," in reference to the doughy consistency which this soil shows in the roads.

The Sharkey clay occurs in large, irregular tracts in the interstream areas of the delta, forming a central, basin-shaped depression, surrounded by the higher-lying soil types previously described. It is the most extensive type in the survey, forming about one-half of the entire area. On the other hand, it is at present the least important agriculturally, little if any of it being under cultivation.

The Sharkey clay is formed, like the other delta soils, by deposition of material brought down by the flood waters of the Yazoo and Mississippi rivers and their tributaries. Much of the type is subject to annual overflow, while all of it is under water at least once in six or eight years. The areas are flat or basin-shaped, and the rain water as well as the flood water is collected and held for long periods. It is usually July before the soil is dried out enough to allow plowing, and this is too late for cotton planting. Crops requiring a shorter season might be produced on some of the higher areas of this soil, but as yet practically no attempt has been made to utilize it in this way.

The Sharkey clay is covered with a heavy growth of forest com-

posed of oaks, gums, and other deciduous trees. The undergrowth consists of dwarf palmetto, coarse grass, shrubs, and briers. There was formerly some cypress along the bayous and sloughs, but this has been generally cut out. The timber standing now is said to be better for firewood than for any other purpose. (See Pl. XVII.)

There is no doubt whatever that this soil is very fertile, and there is practically no reason to doubt that with a proper system of levees and drains much of it could be brought under cultivation and made to produce good crops of cotton, rice, and corn. But the cost of such reclamation would be very great and the work so extensive as to be beyond private means. The problem is one for the State or for some corporation of immensely greater resources than any yet formed, at least in this country, for the promotion of agricultural projects.

The areas of Sharkey clay are said to be somewhat more valuable than a few years ago. Tracts are now held at prices ranging from $2 to $10 per acre. The value must probably be ascribed to the standing timber.

The following mechanical analyses show the exceedingly fine texture of this soil:

Mechanical analyses of Sharkey clay.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7984	3 miles SW. of Satartia.	Dark-gray clay loam, 0 to 5 inches.	3.88	0.18	0.46	0.88	3.10	3.16	44.54	47.16
7986	4 miles SW. of Valley Park.	Mottled brownish clay, 0 to 6 inches.	2.34	.02	36	.36	1.32	3.70	30.74	63.40
7985	Subsoil of 7984	Gray clay with fine sand, 5 to 36 inches.	1.42	.08	.50	.40	.94	1.18	32.46	64.14
7987	Subsoil of 7986	Mottled yellow to blue clay, 6 to 36 inches.	1.50	.06	.16	20	1.44	2.02	28.92	66.80

MEMPHIS SILT LOAM.

The Memphis silt loam consists of 8 to 12 inches of brownish-yellow silty loam, underlain by heavier chocolate-brown silty loam. The soil when dry is quite powdery, with a texture not unlike well-ground flour, and when moist it is plastic, but not sticky. The subsoil when dry crumbles into a fine powder, and when wet it is both plastic and sticky, exhibiting some of the properties of clay.

This soil is remarkably uniform in texture throughout both the Cane Hills and Flat Hills regions of the upland, but the depth of the

soil averages less in the Cane Hills than in the Flat Hills, a difference due to greater erosion in the former region. (See Pl. XVIII.)

In the Flat Hills, however, near the Big Black River, areas are occasionally found in which the soil and subsoil have a grayish tinge and contain many aggregations of dark-brown iron concretions about the size of peas.

In the Cane Hills the surface of the Memphis silt loam is made up of steep, V-shaped gullies and stream valleys, between which hundreds of very narrow ridges and cross ridges rise to a height of from 50 to 150 feet. Often the tops of these ridges are only wide enough to accommodate a wagon road, while rarely are they as much as one-fourth of a mile in width. Only about 15 or 20 per cent of the Cane Hills is cultivated. The fields are mostly limited to the tops of the ridges. The remainder of the Memphis silt loam in this region is largely covered by a native growth of oaks, hickory, and beech, with an undergrowth of switch cane. This limitation of the cultivated areas is made necessary by the fact that the land on the hillsides washes very badly.

In the Flat Hills, on the other hand, the Memphis silt loam presents a surface only moderately hilly, with no very deeply cut stream valleys and with frequent quite wide expanses of rather flat or gently rolling lands. In this region a larger proportion of the soil is under cultivation, possibly 35 or 40 per cent being worked at present.

The texture and physiographic position of the Memphis silt loam makes it subject to extremely severe washing. Even in the Flat Hills section of the area and in the more level fields large gullies are constantly forming under the action of the occasional torrential winter rains.

The surface drainage of this soil is very good, but although the type possesses a loamy texture water does not readily percolate into it. The rain water is often held in slight depressions many days before it soaks in. On the other hand, the soil retains moisture well, the subsoil being generally quite moist even in dry weather.

The Memphis silt loam is derived by the process of weathering from the unconsolidated yellow silt or loess covering the entire upland area.[a] The loess mantle is from 20 to 40 feet thick and is very uniform in texture, which accounts for the almost entire absence of local variation in the soil.

The Memphis silt loam is not as rich in organic matter as the delta soils. To the proportionally less vegetable remains may in part be ascribed the lower crop yields of this soil as compared with the Yazoo loam or other delta soils.

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[a] For a discussion of the loess as found in this region see Report Field Operations, Bureau of Soils, 1901, pages 365 to 368.

The principal crop in the uplands, as in the delta, is cotton. Occasional fields of corn, cowpeas, and grass, grown for feed for the work stock, occur, and some vegetables are produced here and there in gardens and for home use. The yield per acre of cotton ranges from about one-half bale to three-fourths bale, and of corn from about 10 to 25 bushels. There is apparently little difference in the yields in the Cane Hills and in the Flat Hills.

Besides the crops grown, to which the soil seems well adapted and of which much higher yields could be secured by the introduction of crop rotation, green manuring, and other established methods, there would seem to be many products suited to the Memphis silt loam. The further introduction of cattle raising, especially in the Cane Hills region, where there are wide areas of woodland suitable for pasture, and the growing of more forage crops for winter feeding on the areas now used exclusively for cotton are suggested as practicable changes in present agricultural practices. The experimental growing of grapes and other fruits is recommended. It is upon a loessial soil that the great vineyards of Germany are established, while apples and pears are being successfully produced on a soil of like origin in Illinois and in other States of the Central West.

Judging from the kitchen gardens, the Memphis silt loam is an excellent soil for truck growing. Sweet potatoes and peanuts also produce well. As yet none of these crops are grown on a commercial scale.

The average valuation of land in the Cane Hills ranges from about $2 to $12 an acre, while in the Flat Hills it is from $5 to $17 an acre.

About 80 per cent of the Cane Hills region supports a heavy forest of white oak, red oak, post oak, hickory, and beech. The oak makes good lumber. Much white oak is sold to barrel-stave factories. In the Flat Hills these same forests occur, occupying perhaps 50 per cent of the area.

The upland is more thickly settled than any of the delta country. The population (about 60 per cent colored) averages about 40 to the square mile. In the delta the average is about 30 inhabitants per square mile, 90 per cent being negroes. This is accounted for by the fact that the hill country is regarded as being more healthful than the delta. Many who own lands in the delta area reside in the uplands. This arrangement was more common during slave times than now, but it still prevails to some extent.

Most of the buildings were built many years ago. The farmhouses range in value from about $800 to $3,000, while the average barn may be worth from about $100 to $500. In addition, there are usually a number of negro cabins worth from $20 to $100 each. The farms range in size from 40 to over 1,000 acres, but the usual size is between 160 and 300 acres.

The following table of mechanical analyses shows the texture of samples of the soil and subsoil of this type:

Mechanical analyses of Memphis silt loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7980	½ mile NW. of Bentonia.	Dark-brown silty loam, 0 to 12 inches.	1.20	0.00	0.30	0.26	0.42	1.96	88.48	7.96
7978	¾ mile NW. of Bentonia.	Dark-brown silty loam, 0 to 12 inches.	1.15	.30	.84	.58	.74	2.86	83.80	10.62
7982	6 miles W. of Bentonia.	Brown silty loam, 0 to 6 inches.	.96	.00	.20	.40	.50	2.94	80.16	15.16
7979	Subsoil of 7978.....	Brownish-gray silty loam, 12 to 36 inches.	.41	.08	.82	.44	.60	2.58	76.92	18.02
7981	Subsoil of 7980.....	Brown silty loam with clay, 12 to 36 inches.	.31	.00	.10	.12	.24	1.70	79.54	18.16
7983	Subsoil of 7982.....	Brown silty clay, 6 to 36 inches.	.42	.00	.10	.10	.14	1.18	79.54	18.42

LINTONIA LOAM.

The Lintonia loam consists of the silt washed from the bluffs or uplands and deposited in fans or cone-shaped deltas or terraces along the margin of bottom lands. At the base of the bluffs this material is 12 or 15 feet deep, while where it joins with the delta soils, a distance of from one-half to three-fourths of a mile from the bluff, the depth does not exceed 1 foot. There is little difference between the soil and the subsoil of this type, both being a uniformly textured, dark-brown silty loam, with occasionally a slight admixture of sand.

This soil occurs as a strip about three-fourths of a mile wide skirting the bluff separating the delta from the upland along the Yazoo River and as a well-marked second terrace along the Big Black River. The surface slopes gently away from the bluff. The inclination is nowhere greater than 15 dgrees, and in some places the gradient is so slight as to make the surface appear level. The Lintonia loam is rarely overflowed, except locally by floods in the streams draining from the uplands. The even surface and unbroken slope make the surface drainage very thorough.

As already intimated, the origin of this type is to be found in the transportation of the loess of the bluffs and uplands, principally the former, by erosion. It is a true colluvial or colluvial and alluvial deposit, and whatever differences in texture occur between this and

the upland soil type, Memphis silt loam, are due to the sorting of particles by the agency of transportation, which is chiefly the rain waters.

As would naturally be expected, the mineral constituents of this soil do not differ greatly from those of the upland soil, though the proportions of both the soluble salts and organic matter are somewhat higher. The yields indicate the superior fertility of this soil.

As with the other soils, the chief crop of the Lintonia loam is cotton, of which the yield per acre ranges from three-fourths of a bale to over 1½ bales. The average yield is probably about 1 bale. Good yields of corn, cane, and grass are also secured. Nearly all of the type is cleared and under cultivation.

The Lintonia loam, as might be inferred, is adapted to a wide range of crops. The usual farm crops, such as cotton, corn, and forage crops, all do well, and the various truck crops, such as sweet potatoes, Irish potatoes, cabbages, melons, etc., also thrive. Strawberries, raspberries, peaches, plums, and pears are grown to some extent and seem to flourish. The cultivation of these crops might be profitably extended. The Lintonia loam is highly esteemed by the farmers.

The following table of mechanical analyses shows the texture of samples of the soil and subsoil of the Lintonia loam:

Mechanical analyses of Lintonia loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7976	3½ miles W. of Phœnix.	Dark-brown silty loam, 0 to 10 inches.	1.64	0.20	0.42	0.84	6.10	7.60	76.40	8.44
7974	1 mile S. of Bentonia.	Dark-brown silty loam, 0 to 10 inches.	.76	.04	.62	.62	1.18	7.38	81.58	8.80
7977	Subsoil of 7976.....	Brown silty loam, 10 to 36 inches.	.31	.20	.50	.36	4.90	11.90	74.22	7.90
7975	Subsoil of 7974.....	Brownish-gray silty loam, 10 to 36 inches.	.51	.00	.48	.50	1.14	3.60	76.10	18.12

MEADOW.

The Meadow type of this area consists of a dark, rich, silty loam 8 to 15 inches deep, underlain by a lighter-colored subsoil quite similar in texture to the soil. In the Cane Hills the type often has a slight admixture of fine sand and occasionally some gravel, derived from the Orange sand stratum. In the Flat Hills the type is quite uniformly

a rich, dark-brown silty loam, the subsoil being in some cases drab colored instead of brown, and containing considerable quantities of brown and black iron concretions.

The greatest expanse of Meadow occurs along the Big Black River, while small areas occupy the small, narrow stream bottoms occurring in the upland area.

The Meadow areas are flat, low-lying, and wet, and by reason of their location are subject to overflow from the sudden rise of streams following a heavy rainfall.

When the streams are at their normal stage the drainage of this type is very good. On the other hand, it is always sufficiently moist from seepage waters that come from the hills.

The Meadow areas have been formed by sediments deposited by the streams. Most of the material has come from the uplands and consists of silt and clay. In the Cane Hills region, however, where the streams have in many instances cut entirely through the loess and the Orange sand down to the blue Eocene clay, some trace of gravel and sand has been intermingled with the finer materials. The depth of this flood plain material usually varies from 3 to 6 feet.

The minerals composing the Meadow are quite similar to those of the Memphis silt loam. The Meadow, however, by reason of the processes of its formation and its low-lying position, contains more decayed vegetable matter, and is therefore a more fertile and productive soil.

Cotton and corn are the principal crops grown on the Meadow. The yield per acre of the former averages 1 bale; of the latter, about 30 bushels. Grass and other forage crops also produce well, yielding from 2 to 5 tons per acre in two or three cuttings. Cane yields about 300 gallons of sirup per acre on these lands. Excepting the large area along the Big Black River, most of the type is cleared and cultivated. The original forest consisted largely of gum, sycamore, and poplar, these being still found on areas unsuitable for tillage.

Under normal conditions the crops just named are well adapted to this soil type. The fact that so much of the Meadow lands is cleared and cultivated indicates their value. In the Cane Hills region this type and the tops of the Memphis silt loam ridges are the only areas admitting of cultivation. The meadows here, lying as they do in the bottoms of deep, narrow gullies and valleys, are often considerably shaded, and cotton has a tendency to rust badly. The very deep and narrow bottoms are often used for permanent pasture, while some are still forested.

In the Flat Hills, where the stream bottoms are not so deep, and therefore less shaded, the cotton suffers less injury from rust and other fungous diseases. Crops in the Meadow areas are also always subject to damage by flooding.

AGRICULTURAL CONDITIONS.

The farmers of the Smedes area consist of whites and negroes in the proportion of about 1 to 9 in the delta section and about 2 to 3 in the upland. The greater number of the negroes live from hand to mouth, giving little heed to the future and spending their earnings freely to satisfy some present whim or appetite. A spirit of idleness is said to be on the increase among them. Even when it is most urgent that cotton should be picked, many stop work on Friday and do not return to work again until Monday or Tuesday. It is, therefore, not strange that the negroes as a whole are not in a prosperous condition. There are, of course, exceptions, but they are rare. Some negroes own the land they till, but the vast majority of them are tenants.

The white farmers, on the other hand, usually own their lands and as a whole are in a fairly prosperous condition, while some are wealthy. There are only occasional instances of actual poverty among the whites.

There are few foreigners in the area, most of the planters being descendants of sturdy English stock that settled here during colonial times. Many of these became large landowners through the liberal grants of the English Government.

The civil war was disastrous to the agriculture of this region, and the effects of that struggle have hardly been effaced as yet. Retarded by this and hampered by the unreliability of the negro labor and insufficiency of the school system, the agricultural industry has not made the advance that the naturally fertile soils would seem to justify. Men of means hesitate to invest capital under such untoward conditions.

The following tables, compiled from records of the Twelfth U. S. Census, present some interesting facts of general application to the area:

General farm statistics for the State and also for five counties parts of which come within the limits of the Smedes area.

Division.	Proportion in delta or upland.	Number of farms.		Acres in farms.			
		Total.	With buildings.	Total.	Improved.	Average size.	Per cent improved.
The State	About one-sixth in delta and five-sixths in upland.	220,803	211,299	18,240,736	7,594,428	82.6	41.6
Issaquena County	Entirely in delta area.	1,646	1,593	90,676	55,052	55.1	60.7
Sharkey County	do	2,043	2,019	80,362	61,115	39.3	76.0
Warren County	About one-third in delta and two-thirds in upland.	4,058	3,649	221,851	116,942	54.7	52.7
Yazoo County	About one-half in delta and one-half upland.	6,741	6,549	428,145	238,098	63.5	55.6
Madison County	Entirely in upland	4,717	4,565	341,388	218,172	72.4	60.7

General farm statistics for the State and also for five counties parts of which come within the limits of the Smedes area—Continued.

Division.	Values of farm property.				Value of product not fed to live stock.	Expenditures.	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		Labor.	Fertilizer.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
The State.....	114,856,660	37,150,340	9,556,805	42,657,222	90,743,658	3,917,256	932,098
Issaquena County.	1,456,110	413,870	110,085	334,035	887,071	34,702	786
Sharkey County...	2,222,100	463,300	125,510	416,466	1,356,880	81,260	1,690
Warren County....	2,176,090	627,210	182,500	706,581	1,794,695	144,370	1,960
Yazoo County.....	4,749,260	1,251,420	346,720	1,323,842	3,493,122	239,850	7,320
Madison County...	2,600,660	882,420	180,060	878,489	1,860,708	117,190	8,790

The above table shows that the counties in the delta area use very much less fertilizer than those in the upland. This is accounted for by the fact that the delta lands, already fertile, are sufficiently enriched by the frequent floods to maintain their fertility.

The figures showing the average size of farms are very misleading. This results from the tabulation of the patches farmed by negro tenants in 20 or 40 acre tracts as farms, whereas one white man may own a half-section or a section of land on which a dozen negro families may have holdings. Looked at from the standpoint of ownership, the average size of farms lies between 160 and 300 acres. Tracts of 500 to 2,000 acres are probably more often found in the delta than in the upland, and the lower average size in the delta, as given by the census, indicates only the greater extension of the negro tenant system in that part of the area.

The figures relating to condition of tenure are not available by counties, but for the State at large they show that the percentage of renters among the negroes is much greater than among the whites, both, however, being quite high. Of the whites, 62.5 per cent own their land, while but 14.3 per cent of the negroes are landowners. The manager class is relatively small, but is believed to be on the increase.

In the area surveyed, lands are rented both on a cash and a share basis. The method most commonly practiced is to rent the land at the rate of $5 per acre. The landowner then supplies the tenant with the necessary provisions until the crop is harvested and sold. The rent of land and bill for provisions and other necessaries are then deducted from the amount realized from the sale of the crop, and any proceeds remaining go to the tenant. Often the tenant is in debt at the end of the season, owing in part to his improvidence, the higher rate he has to pay for his necessaries by reason of his running his account for a year or more, or to the low price of cotton. Greater thrift, enabling the tenant to work on a cash basis, would undoubt-

edly be of marked advantage to himself and to all concerned. It is, however, very unlikely that a change in existing conditions will be brought about for many years to come.

Cotton is the one great staple and the money crop of the area, and nearly all farm operations revolve around its production. Long-staple cotton is usually grown on the richer lands, while on the thinner lands the short staple is grown. The long staple brings from 10 to 15 cents per pound when the short staple brings from 7 to 9 cents. However, the yield per acre of the former is less, and it is more susceptible to adverse conditions than the short-staple cotton.

Some corn, oats, and hay are grown. Small fruits, some orchard fruits, and truck crops are also grown, but only for local use. The production of these crops might be extended with profit. In the upland section the fattening of cattle is already assuming some importance, and an extension of this industry may be looked for.

Good corn crops are not, as a rule, secured in the Smedes area. The low rate of yield is apparently due more to lack of proper preparation of the seed bed and to lack of proper cultivation than to any deficiency of the soil or climate. It would seem that the methods employed so successfully in producing corn in Ohio, Illinois, Minnesota, and the Dakotas might be used with success here.

There is frequently a shortage of corn and other feed stuffs in the area, and the work stock have to be fed on corn brought into the area from other parts of the country. This feed is generally expensive, and this alone should impress the farmers of this section with the importance of modifying their field methods sufficiently at least to provide subsistence for the live stock carried on the plantations.

The adaptation of soils to crops has not been worked out to any great extent in the area. Cotton is grown on all the soils, and there is so little diversification that the special capabilities of the different types have not been experimentally determined. The subject has been treated of in the description of the soils, but it is so important a part of the soil survey that a recapitulation of the crops and crop possibilities of the several types will be given here.

The Yazoo sandy loam, by reason of its lighter texture and its location on higher ground next the streams, apparently is one of the best in the area for the production of small fruits and truck crops. The rate of yield of cotton, about three-fourths of a bale per acre, is not as high as for the other delta soils; and although with proper rotation of crops this rate could be materially increased, yet, since the area of this type is relatively small, it would seem as if it might be used almost entirely for truck crops and small fruits, while cotton could advantageously be confined to the heavier soils, more nicely adjusted to its production.

The Yazoo loam is also adapted to truck crops, but is better for

cotton than the Yazoo sandy loam. It is also a better soil for corn and grass, and it could be advantageously devoted more largely to the production of forage crops.

The Yazoo clay is the typical cotton soil of the delta, but it is also well adapted to corn, oats, the grasses, cowpeas, and other crops of this character. Only in rare cases, and then only for a few kinds of vegetables preferring heavy soils, could this soil be profitably used for truck growing.

Very little of the Sharkey clay is cleared and tilled. If diked and drained, this soil should be valuable for rice growing, as well as for cotton and general farm crops. The type has undoubtedly possibilities that will be developed when the demand for land for farming purposes becomes greater. For the present the standing timber forms its chief value, and some rational system of forestry might be successfully practiced even without the cost of reclamation. Poplar lumber is in great demand and brings a high price in the market, and it would seem as if this tree, which is of rapid growth, might be grown on this type with profit.

The Memphis silt loam, the principal soil type of the upland, in the Cane Hills is well adapted to grazing cattle, sheep, and goats. The native switch cane is the forage depended on at present, but this could be supplemented by growing Bermuda grass, Japanese clover, and alfalfa. Fruit would do well here, and the grape industry is one of the untried possibilities. In the Flat Hills, also, the industries already named should prosper on the Memphis silt loam, and in addition truck growing might be introduced. At present the soil is used chiefly for cotton.

The Lintonia loam apparently would be an excellent soil for trucking. Berries, peaches, and pears can also be produced in abundance. The staple crops of the area give good yields on this soil.

The Meadow type, occurring as it does as bottom land along the small streams of the upland, is valued mostly for growing cotton, corn, and grass. The areas too narrow or difficult to till are used as permanent pasture or allowed to remain in forest.

Both rail and water transportation are available to the farmers of the Smedes area. The Mississippi, Yazoo, and Big and Little Sunflower rivers and some of their branches are used for shipping cotton and other crops to market from the delta area. A through line of railroad traverses the Deer Creek region of the delta, connecting with Vicksburg and other points. In the upland section a railway passes through Bentonia, connecting with Jackson, Memphis, and other important markets. In addition to this other lines are being projected through both upland and delta regions; and if these materialize, they will go far toward effecting the needed diversification of crops.

The wagon roads of the delta are very bad during wet weather, and even in the upland the roads are not much better.

There are practically no local markets in the area. Only a few small towns, with populations ranging from 20 to 100, are situated within it. These create little or no demand for truck, small fruits, or poultry products. They serve, however, as centers for merchandising and cotton buying. Such places, when situated on a railway or navigable river, are the scene of much activity during the movement of the cotton crop, and throughout the year the trade in general merchandise is often very heavy. Local merchants often acquire considerable cotton in trade for supplies. Some of the cotton grown in the area is shipped to Yazoo City, where there is a compress, and some goes to Jackson and Vicksburg, but the great bulk of the crop is shipped by boat and by rail directly to New Orleans.

On the whole, the area possesses great undeveloped possibilities. With an increase of population and the introduction of better labor or the better education of the present laboring class, trucking, fruit growing, stock raising, and other industries will doubtless be introduced and prosper.

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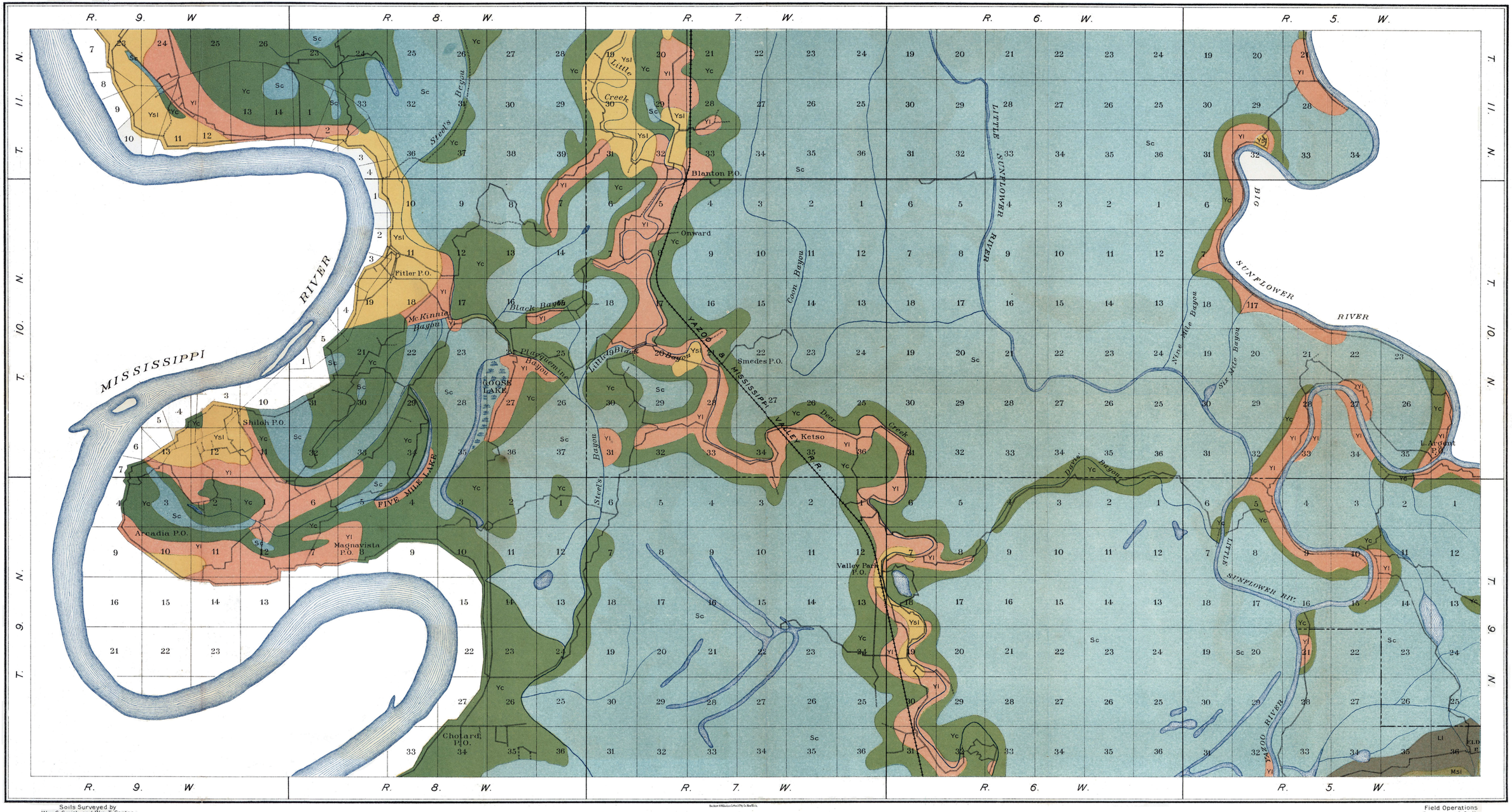
SOIL MAP

MISSISSIPPI
SMEDES SHEET



SOIL PROFILE
(3 feet deep)

Yazoo sandy loam — S / Ssc
Yazoo loam — Sic / C
Lintonio loam — Sic / Sic
Memphis silt loam — Sic / Sic
Yazoo clay — C / C
Sharkey clay — C / C

LEGEND
S Fine sand
Ssc Sandy loam
Sic Silt loam
C Clay

LEGEND
Ysl Yazoo sandy loam
Yl Yazoo loam
Ll Lintonia loam
Msl Memphis silt loam
Yc Yazoo clay
Sc Sharkey clay

Soils Surveyed by
Wm. O. Smith and Wm. T. Carter.
1902.

Scale 1 inch = 1 mile

Field Operations
Bureau of Soils
1902.